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10/678,068	10/06/2003	Kwang-Deok Seo	P-0557	4081

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EXAMINER	
STOKELY-COLLINS, JASMINE N	

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2423	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/678,068	SEO, KWANG-DEOK	
	Examiner	**Art Unit**	
	JASMINE STOKELY-COLLINS	2423	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-25,28,33 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-25,28,33 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 22 and 33 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues, on page 9 of applicant's arguments, that Aksu does not teach converting a segment header of a media data sample having a new I-frame into a representative header in addition to the header of the new I-frame. The examiner agrees; However, Japanese Patent 2003-114845 to Kimura et al teaches the moof 23 part of an original stream 53 is converted to moov 71 in the conversion processing part 56 of a delivery server. According to the above means, a stream started from the middle of the original contents can be realized on a server side with a slight processing quantity, and the regeneration from the middle can be realized on a terminal side without changing the prior and existing receiving and regenerating processing of stream. "Moov" and "moof" are the specific representative header and segment header referred to in applicant's specification.

Applicant also argues, on page 10, that Lin does not teach a random access point being input by a user at the remote unit. In interest of furthering prosecution, the examiner references previously cited US Patent 6,314,466 to Agarwal which teaches "In one embodiment, a user interface of a client rendering program presents a text box in which **a user may enter via keystrokes a frame number of a frame-based multimedia object.** In that embodiment, the client rendering program transmits a data

packet including a request for the frame-based multimedia object and the frame number at which to begin playback." Agarwal clearly teaches random access where a user inputs a request for a specific frame

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 22-25, 28, and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agarwal (US 6,314,466) in view of Lin et al (US 6,738,980), Wee et al (US 6,104,441), and in further view of Kimura et al (JP 2003-114845).

Claim 22:

Agarwal teaches a video streaming method , comprising:

receiving, by a transmitting server (streaming media server 110), information of a specific random access point from a remote unit, the specific random access point being input by the user at the remote unit (col. 8 ll. 41-51);

searching for the specific random access point in a content file stored in the transmitting server in response to the transmitting server receiving the information of the specific random access point input by the user at the remote unit (col. 8 ll. 52-56).

Agarwal does not teach reconfiguring a data stream based on a screen type of the specific random access point input by the user and a coincidence between the specific random access point and a data transmission starting point, wherein reconfiguring the data stream comprises:

determining an existing I-frame that is most similar to the specific random access point when the specific random access point is determined to be a P-frame and is the data transmission starting point, converting the P-frame into a new I-frame based on values of the existing I-frame and a next P-frame, wherein the converting is performed until the next P-frame is the specific random access point;

configuring a media data sample based on the new I-frame as the data transmission starting point,

configuring a new data stream using the media data sample and continuous media data samples, and

converting a segment header of the media data sample having the new I- frame into a representative header in addition to a header of the new I-frame; and transmitting the new data stream including the converted representative header from the transmitting server to the remote unit.

Lin discloses that if a random access point selected by the user is an I frame, the starting point of the stream is that I frame (see col. 2 ll. 19-22). however, if the random access point selected is a P-frame, the system must adjust the starting point of the stream to the most recent I frame and transmit the

most recent I frame with all the p frames leading to the requested random access p frame (see col. 4 ll. 24-32) The coincidence between the random access point and a data transmission starting point is that if the requested random access point is an I frame, the data transmission starting point is that I frame, however if the random access point is a p frame, then the data transmission starting point will be the closest I-frame. Although Lin does not explicitly teach determining the existing I-frame that is most similar, one of ordinary skill in the art would recognize that the I-frame closest in proximity is generally the I-frame that is most similar. The closest I-frame would be the I-frame that the P-frame is dependant upon. The fact that the target P-frame is dependent upon that I-frame, as opposed to other I-frames, implies the closest I-frame is the most similar because it has the strongest dependency. The disclosure by Lin reads on "reconfiguring a data stream according to a screen type (frame type) of the random access point and a coincidence between the random access point and a data transmission starting point" and "determining an existing I-frame most similar to the random access point when the random access point is determined to be a P-frame and is the data transmission starting point" (by determining the I-frame the random access point is dependant upon).

Lin also discloses that when either the random access I frame or the closest I frame is sent (depending on the screen type of the random access point chosen by the user), the rest of the frames in the stream are sent as well (see Fig. 6B, where a random access point 22 in the forward stream was chosen.

Frame 22 in the forward stream is a p- frame. The closest I frame was searched and found to be I frame 21 in the reverse stream. I frame 21 and the rest of the following frames (frames 22, 23, 24, etc...) in the forward stream were sent to the user), this disclosure by Lin reads on "configuring the new data stream using the media data sample and the continuous data samples", where the media data sample is the closest I frame, I frame 21 in the reverse stream, and the continuous data samples are the rest of the frames in the forward stream. Had only the forward stream been available at the server, the closest I frame, I frame 14 in the forward stream and the rest of the frames leading to frame 22 would have been sent along with the rest of the frames following random access frame 22 in the content file. This new stream is transmitted to the user (see supporting text col. 8 ll. 59- col. 9 ll. 15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lin's teaching of reconfiguring a stream based on a random access request for the benefit of lowering the transmission cost of sending a trick play stream by reducing the number of frames transmitted a thereby reducing the amount of bandwidth used.

Agarwal in view of Lin does not disclose "configuring a media data sample based on the new I-frame as the data transmission starting point" and "converting the P-frame into a new I-frame by calculating values of the existing I-frame and a next P-frame, repeatedly performing the converting until the next P-frame is the random access point to convert the P-frame random access point

into a final new I- frame" or "changing a first header information of the new data stream".

Wee teaches a method of manipulating and editing a temporal order of an image (manipulating the play order of at least one image frame relative to another, see col. 6 ll. 8-15) for transmission. Randomly accessing points in a video qualifies as such because the user is accessing images in a different order than they would otherwise be played, by skipping to a desired frame. If the target frame (see col. 11 ll. 35-54; in this case, the target frame is P7) is not an I-frame, the routine follows the dependencies until it determines the closest I-frame (I1) which the target frame either directly or indirectly (i.e. frame P7 depends on frame P4, which depends on frame I1) depends on. The routine converts any P-frames in the line of dependency to I-frames until the target frame is ultimately converted to an I-frame (“For example, if a frame P7 which is to be transcoded is discovered to depend on frame P4 which in turn depends on frame I1, a nested transcoding subroutine is then called using frame P4 as the current frame and frame I1 as the reference frame, to convert frame P4 to independent frame I4. This process, indicated by a function block 251 of FIG. 6, is performed in as many nested loops as necessary to yield an I frame as reference frame for use with the P frame 241. In the hypothetical involving frames P7, P4 and I1, a dominant subroutine of the editor uses frame P7 as the current frame and frame I4 as the anchor frame, **to yield frame I7**.”). Wee's frame conversion does occur until the target frame (P7) is converted into an I-frame (I7). Wee further converts

the header of the converted frame to reflect its change to an I frame (col. 11 ll. 66-col. 12 ll. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of "receiving a random access request from a remote unit by a transmitting server; searching a random access point in a content file stored in the transmitting server in response to the transmitting server receiving the random access request; reconfiguring a data stream according to a screen type (frame type) of the random access point and a coincidence between the random access point and a data transmission starting point", "searching an existing I-frame closest to the random access point when the random access point is determined to be a P-frame and is the data transmission starting point", and "configuring the media data sample having an I-frame as the data transmission starting point" of Lin with the method of "converting the P-frame into a new I-frame based on values of the existing I-frame and a next P-frame, wherein the converting is performed until the next P-frame is the specific random access point" of Wee for the benefit of gaining access to individual frames in fast-forward, rewind, editing, or splicing operations, thereby enhancing the viewers experience.

Further, the combined teachings of Lin and Wee suggest “configuring a media data sample based on the new I-frame as the data transmission starting point”. Lin teaches transmitting a reference frame with the least cost when random access is requested (col. 8 ll. 2-6), where reducing the costs provides the benefit of minimizing the number of frames sent to the decoder, and network

traffic. Costs can be calculated based on “distances from the possible reference frames to the next requested frame” and/or “the numbers of bits required for decoding the next requested frame” (the sum of the bit-rates of those frames to be transmitted) (col. 6 ll. 23-30). When combined with Wee’s teaching of converting P-frames and B-frames into I-frames (col. 11 ll. 35-54 and col. 12 ll. 8-24), all of which can be done prior to transmission to the receiving unit (see fig. 3), the frame with the least cost would be a converted I-frame because starting a stream form the converted I-frame minimizes the number of frames sent to the decoder and also provides the most minimal amount of network traffic when compared to transmitting an original I-frame. Therefore, Lin in view of Wee teaches transmitting the newly created I-frame (configuring a media data sample having the new I-frame as the data transmission starting point). Lin also teaches continuing with forward-play after accessing the requested random access frames (col. 7 ll. 65-col. 8 ll. 18) (configuring a new data stream using the media data sample and continuous media data samples).

Neither Lin nor Wee disclose "changing a first header information of the new data stream in addition to the header of the new I-frame" and “transmitting the new data stream including the first header information from the transmitting server to the remote unit.

In related art, Kimura teaches accessing MPEG (MP4, specifically) content at a point other than the beginning. Kimura teaches converting a segment header (moof) into a representative header (moov) when reproducing

from the middle of contents (sect. 0007). It would have been obvious to one of ordinary skill in the at the time the invention was made to modify the method taught Lin in view of Wee with the teachings of Kimura for the benefit of providing access to contents at points other than the beginning of a stream/sub-stream. Further, Kimura teaches simply replacing the segment header with a representative header without affecting the data portion (which contains the frame) (sect. 0007, where all mdat sections are copied to the new headers). Therefore, the header of the converted I-frame, which Wee teaches in col. 11 ll. 66-col. 12 ll. 6, would be left intact (the converted header is in addition to any frame headers) because the I-frame header is attached to the frame and contained in the data portion mdat. This reads on applicants claimed header conversion “in addition to a header of the new I-frame”.

Claim 23:

Agarwal in view of Lin, Wee, and Kimura disclose the method of claim 22 as discussed previously. While Agarwal does not specify a file format, Lin discloses that the streaming media file consists of an MPEG file.
However, neither Agarwal nor Lin nor Wee disclose "an MP4 file applied by a file fragmentation process, and the data stream includes a plurality of media data samples and a plurality of headers of the respective media data samples."

Kimura discloses the use of MP$ file fragmentation for sending an MPEG file (sect. 0003). It would have been obvious to one of ordinary skill in the art at

the time the invention was made to use MP4 as an MPEG format because it allows streaming of video and, when fragmented, shortens the length of time that a user has to wait before starting to view the streamed media as opposed to a non fragmented MP4 file (sect. 0003).

Claim 24:

Kimura discloses a representative header (sect. 0007 moov70) including common meta information of the respective media data samples and time information of a first media data sample (sect. 0002 moov11comprises header information and each media information (following header information 13), a storing position of each media, and a regeneration time information (time stamp) portion (henceforth, media access information 14), as further shown in drawing 2); and

at least one segment header (sect. 0007 moof25) including time information of the respective media data samples except the first media data sample (see fig. 7 and sect. 0007 "New moov70 is generated from the information on each media (an image and an audio) indicated to moov21, and the information on mdat24 indicated to moof23. Henceforth, mdat of the original stream 53 is copied mdat24 and 26, and moof25 is outputted as moof71, after consecutive numbers are changed.")

Claim 25:

Lin further discloses that the screen type comprises one of an I frame and a P frame (col. 4 ll. 19-27).

Claim 28:

Kimura further discloses the representative header comprises meta information that is common for the media data samples (sect. 0007 "New moov70 is generated from the information on each media (an image and an audio) indicated to moov21, and the information on mdat24 indicated to moof23.")

Claim 33:

Agarwal teaches a video streaming method , comprising:
receiving information of a specific random access point that was input by a user (col. 8 ll. 41-51);
Agarwal does not teach determining a P-frame associated with the specific random access point input by the user; determining an I-frame that is most similar to the determined P-frame; converting a next P-frame that is adjacent to the determined I-frame into a new I-frame based on information of the next P-frame and the I-frame; configuring a media data sample by setting the converted new I-frame as a data transmission starting point after the converting into the new I-frame; converting a ~~segment~~ header of the configured media data sample ~~having~~ the converted new I-frame into a representative header which is other

than a header of the converted new I-frame; and transmitting a data stream having the converted header and the configured media data samples.

Lin discloses if a random access point selected by a user is an I frame, the starting point of the stream is that I frame (see col. 2 ll. 19-22), however, if the random access point selected is a P-frame ("determining a P-frame associated with the specific random access point input by the user”), the system must adjust the starting point of the stream to the most recent I frame and transmit the most recent I frame with all the p frames leading to the requested random access p frame (see col. 4 ll. 24-32) which reads on "determining an I-frame that is most similar to the determined P-frame" and configuring a media data sample by setting an I-frame as a data transmission starting point.

Although Lin does not explicitly teach determining the existing I-frame that is most similar to the determined P-frame, one of ordinary skill in the art would recognize that the I-frame closest in proximity is generally the I-frame that is most similar. The closest I-frame would be the I-frame that the P-frame is dependant upon. The fact that the target P-frame is dependent upon that I-frame, as opposed to other I-frames, implies the closest I-frame is the most similar because it has the strongest dependency. Therefore, determining the most recent I-frame (in reference to a requested P-frame) is equivalent to determining the existing I-frame that is most similar to the determined P-frame.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lin’s teaching of reconfiguring a stream based

on a random access request for the benefit of lowering the transmission cost of sending a trick play stream by reducing the number of frames transmitted a thereby reducing the amount of bandwidth used.

Agarwal in view of Lin doesn't teach "converting a next P-frame that is adjacent to the determined I-frame into a new I-frame based on the next P-frame and the I-frame; and
converting a segment header of the configured media data sample having the converted new I-frame into a representative header which is other than a header of the converted new I-frame."

Wee teaches a method of manipulating and editing a temporal order of an image (manipulating the play order of at least one image frame relative to another, see col. 6 ll. 8-15). Randomly accessing points in a video qualifies as such because the user is accessing images in a different order than they would otherwise be played. If the target frame (see col. 11 ll. 35-54; in this case, the target frame is P7) is not an I-frame, the routine follows the dependencies until it determines the closest I-frame (I1) which the target frame either directly or indirectly (i.e. frame P7 depends on frame P4, which depends on frame I1) depends on. The routine converts any P-frames in the line of dependency to I-frames until the target frame is ultimately converted to an I-frame ("For example, if a frame P7 which is to be transcoded is discovered to depend on frame P4 which in turn depends on frame I1, a nested transcoding subroutine is then called using frame P4 as the current frame and frame I1 as the reference frame, to

convert frame P4 to independent frame I4. This process, indicated by a function block 251 of FIG. 6, is performed in as many nested loops as necessary to yield an I frame as reference frame for use with the P frame 241. In the hypothetical involving frames P7, P4 and I1, a dominant subroutine of the editor uses frame P7 as the current frame and frame I4 as the anchor frame, **to yield frame I7**.”). Wee's frame conversion does occur until the target frame (P7) is converted into an I-frame (I7). This reads on “converting a next P-frame that is adjacent to the determined I-frame into a new I-frame based on the next P-frame and the I-frame“. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method taught by Agarwal in view of Lin with the teachings of Wee for the benefit of gaining access to individual frames in fast-forward, rewind, editing, or splicing operations, thereby enhancing the viewer’s experience.

Neither Agarwal nor Lin nor wee disclose "converting a segment header of the configured media data sample having the converted new I-frame into a representative header which is other than a header of the converted new I-frame".

In related art, Kimura teaches accessing MPEG (MP4, specifically) content at a point other than the beginning. Kimura teaches converting a segment header (moof) into a representative header (moov) when reproducing from the middle of contents (sect. 0007). It would have been obvious to one of ordinary skill in the at the time the invention was made to modify the method

taught Lin in view of Wee with the teachings of Kimura for the benefit of providing access to contents at points other than the beginning of a stream/sub-stream. Further, Kimura teaches simply replacing the segment header with a representative header without affecting the data portion (which contains the frame) (sect. 0007, where all mdat sections are copied to the new headers). Therefore, the header of the converted I-frame, which Wee teaches in col. 11 ll. 66-col. 12 ll. 6, would be left intact (the converted header is other than any frame headers) because the I-frame header is attached to the frame and contained in the data portion mdat. This reads on applicants claimed header conversion "in addition to a header of the new I-frame".

Claim 34:

Kimura further teaches converting the header comprises transmitting meta information of respective media data stored in the first header before converting the header (sect. 0007 "New moov70 is generated from the information on each media (an image and an audio) indicated to moov21,and the information on mdat24 indicated to moof23.").

.*Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

5. US 7,743,400 B2 to Kurauchi teaches when resuming transmission of a broadcasted video, sending a substitute I frames in place of a P frame when the P-frame is the data transmission resumption point.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASMINE STOKELY-COLLINS whose telephone number is (571)270-3459. The examiner can normally be reached on M-F 9:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Koenig can be reached on (571) 272-7296. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jasmine Stokely-Collins/

Examiner, Art Unit 2423

/Andrew Y Koenig/
Supervisory Patent Examiner, Art Unit 2423